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**Case**
We describe a case of inflammatory myofibroblastic tumor discovered by a routine chest X-ray in a 26-year-old male patient, primarily diagnosed by fine needle aspiration biopsy. The clinical, cytopathological and differential diagnostic findings of this rare entity are briefly discussed.

**Conclusion**
IMT may be diagnosed accurately on needle cytology samples, provided that other pseudoneoplastic and neoplastic entities can be excluded from its differential diagnosis.

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**Introduction**
Inflammatory myofibroblastic tumor (IMT) of the lung, (plasma cell granuloma/ inflammatory pseudotumor), is widely believed to be an inflammatory entity, rather than a true neoplasm 1. It is a relatively uncommon lesion and represents the most frequent primary benign lung mass lesion in children under the age of 16 2. While the clinical history and radiological findings may often be misleading, a good diagnostic accuracy can be achieved by transthoracic fine-needle aspiration cytology (FNC) 1 3. Conservative surgical resection is the recommended treatment 1 4 5. In this paper we introduce a case of IMT diagnosed by FNC in a 26-year-old asymptomatic male, with an excellent 11 post-operative-years prognosis and briefly review the differential diagnosis of these lesions.

**Case Report**
A 26-year-old man was referred to our Unit of Thoracic Surgery after a routine screening chest X-ray had demonstrated an oval opacity with distinct edges in his right upper lobe. He was asymptomatic and had had no previous illnesses. Blood analyses and electrocardiogram were normal. CT scan showed a well circumscribed 5 cm mass in diameter of variable internal density, located in the upper lobe of the patient’s right lung (Fig. 1). Bronchoscopy and bronchial washings gave negative result. Transthoracic FNC was performed under computed tomography guidance and the cytologic smears showed a typical picture of an IMT. A thoracotomy through the right fifth intercostal space was performed. A well circumscribed mass, 5 cm in diameter, was found in the upper lobe. The mass had...
well-defined margins and could easily be dissected from the surrounding lung parenchyma (Fig. 2). The cytomorphologic diagnosis of IMT was confirmed by tissue study. The patient’s postoperative course was uneventful. He was discharged from the hospital on the 8th postoperative day and is in excellent health conditions 11 post-operative years.

**Cytologic findings**

Transthoracic FNC was performed under computed tomography guidance using a 23-G modified Chiba needle 15 cm in length fitted with an obturator (Ekoject®, Hospital Service, Rome, Italy). Three slides were obtained: one was air dried and stained with May-Grünwald Giemsa (MGG) and two were alcohol fixed. One of these was kept unstained for special studies and one was stained with Papanicolaou (PAP) stain.

The obtained samples were highly cellular. At low microscopic magnification a polymorph cell population was present, composed by spindle, polygonal and bizarre medium sized cells admixed to lymphocytes, plasma cells, eosinophils and mast cells (Fig. 3A).

The medium sized cell population was represented by loosely cohesive or singly dispersed cells with vesicular round-ovoid nucleolated single, double or multiple nuclei, with finely granular heterochromatin. These cells had abundant, well developed cytoplasm of variable shape, from spindled and bipolar to ample and polygonal; translucent in PAP- and blue to violet in MGG-stained smears. In many of the binucleated cells the nuclei were symmetrically placed near the lateral cell borders and showed a single prominent, central nucleolus, so that the overall cell appearance mimicked that of ganglion cells (Fig. 3A). Some of these cells also showed evident intranuclear cytoplasmatic inclusions (Fig. 3B). Often the medium sized cell population was admixed to a variable quantity of stromal substance and to capillary vessels. A rich inflammatory cell component made up of granulocytes, phagocytic histiocytes, lymphocytes and mature plasma cells was always dispersed in the background. An im-
munocytocchemical staining performed on the spare slide showed cytoplasmatic positivity of the medium cells for vimentin and desmin. The cytopathological diagnosis was confirmed by the subsequent tissue study.

**Discussion**

IMT’s are relatively uncommon lesions that may clinically or radiologically mimic a malignant neoplasm and are hence submitted to Fine Needle Cytology. The prevalent cellular composition of these lesions grants their sub classification as mainly fibrohistiocytic (included cases with myofibroblastic differentiation) or lymphoplasmacellular types (so called plasmacellular granuloma) [5,6]. All of these cellular variants of IMT maintain as their hallmark an admixture of mesenchymal reactive cells and inflammatory cells that should be of help in the differential diagnosis with truly neoplastic conditions [1]. In occasional cases the relative paucity of inflammatory cells may foster cytologic differentiation from true fibrohistiocytic neoplasms and the so called sclerosing hemangioma. The former are more often malignant [7] and can be generally distinguished by IMT on the basis of frank cytological atypias, necrosis and mitotic activity, while sclerosing hemangioma, though having a similar cellular composition, lacks cytological atypias, also shows cuboidal epithelial cells and has a different immunocytocchemical profile [8].

Differential diagnosis with other neoplastic entities (i.e: metastatic melanoma, papillary thyroid and renal cell carcinoma, bronchoalveolar carcinoma) should not be posed on cytological bases [3] in our opinion. Most IMT’s run a smooth clinical course, though some might rarely grow to a large size and be also locally invasive, requiring extensive surgical resection [4,9]. If large series of IMT are studied, their long-term prognosis as a whole becomes somewhat unpredictable with late and occasionally fatal recurrences. The possibility of an occasionally aggressive clinical course may be bound to their described angioinvasive properties and cytogenetic clonal changes [10]. Complete resection, when possible, is safe and leads to excellent survival. Incomplete resection is a risk factor for recurrence of IMT. Relapse with multiple lung nodules after pulmonary resection and metastases in multiple organs are extremely rare [6]. Cases of IMT with unusually aggressive or divergent clinical course might represent low grade fibroblastic and myofibroblastic sarcomas gone underdiagnosed by the tissue study. In conclusion, it is our opinion that the cytological presentation of IMT on FNC samples is sufficiently specific to correctly identify these lesions pre-operatively. Immunocytocchemistry has an important role in demonstrating the mesenchymal nature of the spindle cells and the polyclonality of the lympho-plasmacellular infiltrate, but may not be of help in the differential diagnosis of this entity, that still relies mainly on cytomorphological features alone.

**References**